

540293

10/540293

(12) INTERNATIONAL PUBLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
22 July 2004 (22.07.2004)

PCT

(10) International Publication Number  
**WO 2004/060818 A1**

- (51) International Patent Classification<sup>7</sup>: C02F 1/50
- (74) Agents: LEWEN, Bert, J. et al.; Darby & Darby P.C., P.O.Box 5257, New York, NY 10150-5257 (US).
- (21) International Application Number: PCT/US2003/017882
- (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (22) International Filing Date: 6 June 2003 (06.06.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
60/435,680 20 December 2002 (20.12.2002) US
- (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- (71) Applicant (*for all designated States except US*): LONZA INC. [US/US]; 17-17 Route 208, Fair Lawn, NJ 07410 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (*for US only*): LUDENSKY, Michael [US/US]; 10 Lake Shore Drive, Randolph, NJ 07869 (US). SWEENY, Philip, Gerdon [US/US]; 32 Hillside Road, Hackettstown, NJ 07840 (US).
- Published:  
— with international search report
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

(54) Title: METHOD FOR REMOVAL OF BIOFILM

(57) Abstract: The present invention provides a method for the removal of biofilm, flocculent bulked sludge or bulked biologically active sludge from an aqueous system. The method involves adding one or more chlorinated hydantoin, such as dichloro- or monochlorodialkylhydantoin, to the aqueous system. Alternatively, the chlorinated hydantoin may be formed in situ by adding a chlorine source and an alkylated hydantoin separately to the aqueous system. The invention is particularly advantageous because of the outstanding photostability of the chlorinated hydantoin solutions even when exposed to sunlight.

WO 2004/060818 A1

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/17882

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : C02F 1/50

US CL : 210/696

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 210/696-701, 755, 756, 764; 162/161; 422/14, 15, 16, 37; 514/389

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
NONE

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,662,940 A (HIGHT et al.) 02 September 1997, col. 2 line 59 through col. 3 line 42, col. 9 line 30 through col. 11 line 38, col. 30 lines 33-64	1-18
Y	US 5,565,109 A (SWEENEY) 15 October 1996, col. 1 line 56 through col. 3 line 48	7-9, 14, 15, 17, 18
A	US 5,972,864 A (COUNTS) 26 October 1999	
A	US 6,149,835 A (BROWN) 21 November 2000	
A	US 6,303,038 B1 (SANDERS et al.) 16 October 2001	

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T"

later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X"

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y"

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"

document member of the same patent family

Date of the actual completion of the international search

14 October 2003 (14.10.2003)

Date of mailing of the international search report

13 NOV 2003

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US

Commissioner for Patents

P.O. Box 1450

Alexandria, Virginia 22313-1450

Facsimile No. (703)305-3230

Authorized officer

Peter A. Hruskoci

Telephone No. 703-308-0661